CLAIMS

1. A rotor blade comprising:

a surface;

a fluid repellent structure coated on at least a portion of said surface, said structure having a plurality of nano-nails providing a degree of unevenness and irregularity on said portion of the surface such that water drops do not adhere to the rotor blade surface and rotor blade sound generation in operation of the wind power installation is lessened.

2. A rotor blade according to claim 1 wherein the fluid-repellent structure is coated on at least those parts of the rotor blade where the sound is generated upon rotation of the rotor blade.

3. A rotor blade according to claim 1 wherein the nano-nails are spaced from each other in the range of between 2 and 250 μm and the height of the nano-nails are in the range of between 2 and 250 μm.

4. A rotor blade according to claim 1 wherein the nano-nails are spaced from each other in the range of between 5 and 110 μm and the height of the nano-nails are in the range of between 5 and 60 μm.

5. A rotor blade according to claim 1 wherein the nano nails comprise hydrophobic polymers or durably hydrophobized materials which cannot be detached by natural rain.

6. A rotor blade according to claim 1 wherein the nano-nails are deformable along their longitudinal directions.

7. A rotor blade according to claim 6 wherein the portion of the rotor blade surface coated with the fluid repellent structure is softer than the uncoated portion of the rotor blade surface.

8. A rotor blade according to claim 1 wherein the fluid-repellent structure further comprising a shark-skin-like structure.

9. A rotor blade according to claim 8 wherein the shark-skin-like structure of the rotor blade comprises a plurality of ribs over which a turbulent flow, having a main flow direction, passes, said ribs being orientated in the main flow direction and spaced laterally in relation to the main flow direction, and wherein, said ribs have a height between 30% and 70% of a lateral rib spacing of the ribs.

10. A rotor blade according to claim 9 wherein the standardized lateral rib spacing

$$s^+ = (s / ny)^{\cdot}\sqrt{(tau_0/rho)}$$

is between 12 and 22, wherein s is the lateral rib spacing, tau_0 is the wall thrust stress of a smooth reference surface which is exposed to the same flow, rho is the density of the fluid and ny is the kinematic viscosity of the fluid.

11. A rotor blade according to claim 10 wherein the ribs are of a wedge-shaped configuration.

12. A rotor blade according to claim 11 wherein a taper angle of the wedge-shaped configuration is between 10 and 60°.

13. A rotor blade according to claim 1 wherein portions of the rotor blade is coated with an anti-erosion lacquer providing teflon-like surface properties.

14. A rotor blade according to claim 13 wherein said portion of the rotor blade is the rotor blade leading edge.

15. A wind power installation comprising a rotor blade according to claim 1.

16. A wind power installation comprising a rotor blade according to claim 8.

17. A wind power installation comprising a first member and a second member, the first member including a tower and the second member including a casing which encloses at least one generator of the wind power installation, wherein at least one of the members is provided with a water-repellent structure which is applied at least to a surface portion of said member.